CLAIMS

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1. A method for a rotating electric machine for high voltage, comprising a rotor and a stator having a core and a winding arranged in slots in the stator core, which winding encloses the electric field and is provided by means of an insulated electric conductor (30) comprising at least one current carrying conductor (31) and also comprising a first layer (32) surrounding the current carrying conductor, a solid insulation layer (33) surrounding said first layer, and a second layer (34) surrounding the insulation layer, **characterized** by the stator being cooled down, when it is in operation, to a temperature T1, and the stator being heated up, when it is out of operation, to a temperature T2

2. A method according to claim 1, **characterized** in that the temperature T2, which the stator is heated up to when it is out of operation, is essentially equal to the temperature T1, which the stator is cooled down to when it is in operation.

3. A method according to claim 1, **characterized** in that the temperature T 2, which the stator is heated up to when it is out of operation, is somewhat lower than the temperature T1, which the stator is cooled down to when it is in operation, whereby T2 is preferably in the range of 0 - 20° C lower than T1.

4. A method according to claim 1, **characterized** in that the temperature T 2, which the stator is heated up to when it is out of operation, is somewhat lower than the temperature T1, which the stator is cooled down to when it is in operation, whereby T2 is preferably in the range of 0 - 10° C lower than T1.

5. A method according to any one of the preceding claims, **characterized** in that the winding (8), during assembly of the machine, is installed in the slots (9) of the stator with play which essentially corresponds to the expected expansion of the winding during the operating temperature of the stator.

6. A method according to any one of claims 1 - 4, **characterized** in that the winding, during assembly of the machine and before being installed in the slots of the stator, is deformed mechanically in such a way that the winding will regain its

non-deformed state when it is installed thereafter in the slots so that it bears on the walls of the slots.

7. A method according to any one of claims 1 - 4 or 6, **characterized** in that the winding, during assembly of the machine and before installation in the slots of the stator, is cooled down so that it undergoes thermal shrinkage, after which it is installed in the slots and thereupon regains its original shape as a result of heating so that the winding bears on the walls of the slots.

8. A method according to any one of claims 5 - 7, **characterized** in that the stator, after installation of the winding in the slots but prior to its operation, is heated up to a temperature T3.

9. A method according to claim 8, **characterized** in that the temperature T3 essentially corresponds to the expected operating temperature T0 of the stator, and that the machine only begins operating once this temperature T3 has been reached.

10. A method according to claim 8, **characterized** in that the temperature T3 is somewhat lower than the expected operating temperature T0 of the stator, whereby T3 is preferably in the range of 0 - 20° C lower than T0.

11. A method according to claim 8, **characterized** in that the temperature T3 is somewhat lower than the expected operating temperature T0 of the stator, whereby T3 is preferably in the range of 0 - 10° C lower than T0.

12. A method according to any one of the preceding claims, **characterized** in that an expandable conducting means (22) for transportation of a cooling and/or a heating medium is inserted in ducts (21) provided therefore in the stator core (20), after which said conducting means is allowed to expand so that the conducting means is pressed against the inside of the duct in order to obtain good contact and heat transfer.

13. A method according to claim 12, **characterized** in that the conducting means before insertion is coated with a layer of fusible adhesive agent.

14. A method according to claim 13, **characterized** in that the fusible adhesive agent contains a filler having good thermal conductivity.

15. A method according to any one of claims 13 - 14, **characterized** in that the conducting means expands because it is simultaneously subjected to pressure and heating, thereby bearing on the walls of the duct and that said fusible adhesive agent then melts and essentially fills all cavities between the conducting means and the walls of the duct, whereby the conducting means is secured to the walls of the duct.

16. A method according to any one of claims 12 - 15, **characterized** in that the conducting means, before being inserted in the duct, is deformed radially so as to correspond to a diameter smaller than the diameter of the duct.

17. A method according to any one of the preceding claims, **characterized** in that an expandable conducting means (17; 27) for transportation of a cooling and/or a heating medium is inserted in the slots (19; 29) of the stator core, into the cavities formed between the turns of the winding (18; 28) lying adjacent to each other, after which said conducting means is allowed to expand in such a way that the winding is thereby firmly clamped within the stator slots.

18. A method according to claim 17, **characterized** in that the expandable conducting means for transportation of a cooling and/or a heating medium, before being inserted in the slots of the stator core, is deformed into a profile principally corresponding to the geometric cross-section of said cavities.

19. A method according to claim 18, **characterized** in that said conducting means, before being inserted in the slots, is deformed in such a way that it corresponds to an essentially triangular profile.

20. A method according to claim 17, **characterized** in that the expandable conducting means for transportation of a cooling and/or a heating medium is inserted in the slots of the stator core in a vacuous condition.

21. A method according to claim 20, **characterized** in that said conducting means expands by means of a pressurised fluid being fed into the conducting means.

22. A method according to any one of claims 12 - 19, **characterized** in that the conducting means (22; 17; 27) expands as a result of simultaneously being subjected to overpressure and heating, and that it is cooled thereafter while maintaining overpressure whereby the conducting means maintains its expanded form.

23. A method according to claim 22, **characterized** in that the expansion takes place by means of a heat conducting pressurised fluid circulating within the conducting means (22; 17; 27).

24. A method according to any one of claims 21 or 23, **characterized** in that the pressurised fluid constitutes the cooling and/or heating medium which is used at a later stage for cooling and heating the stator respectively.

25. A method according to any one of claims 12 - 24, **characterized** in that the cooling and the heating medium constitutes the same medium.

26. A rotating electric machine for high voltage, comprising a rotor and a stator having a core and a winding arranged in slots in the stator core, which winding confines the electric field and is provided by means of an insulated electric conductor (30) comprising at least one current carrying conductor (31), comprising also a first layer (32) surrounding the current carrying conductor, a solid insulation layer (33) surrounding said first layer, and a second layer (34) surrounding the insulation layer, **characterized** in that it comprises a device for cooling the stator, when it is in operation, to a temperature T1, and for heating the stator, when out of operation, to a temperature T2.

27. A rotating machine according to claim 26, **characterized** in that the device comprises at least one cooling and heating system for the stator and a supervision system (1) comprising means (3) which measure the temperature of the stator both during operation and out of operation respectively, and means (2) which control the cooling and heating system so that said temperatures T1, which the stator cools down to during operation, and T2, which the stator heats up to when it is out of operation respectively, are obtained and maintained.

28. A rotating machine according to claim 26 or 27, **characterized** in that the temperature T2 which the stator is heated up to when it is out of operation, is essentially equal to the temperature T1 which the stator cools down to when it is in operation

29. A rotating machine according to claim 26 or 27, **characterized** in that the temperature T2, which the stator is heated up to when it is not in operation, is somewhat lower than the temperature T1, which the stator is cooled down to when it is in operation, whereby T2 is preferably in the range of 0 - 20° C lower than T1.

30. A rotating machine according to claim 26 or 27, **characterized** in that the temperature T2, which the stator is heated up to when it is out of operation, is somewhat lower than the temperature T1, which the stator is cooled down to when it is in operation, whereby T2 is preferably in the range of 0 - 10° C lower than T1.

31. A rotating machine according to any one of claims 27 - 30, **characterized** in that the supervision system (1) also comprises means for measuring the temperature of the stator before operating for the first time, means for controlling the cooling and heating system such that the stator, before operating for the first time, is heated up to a temperature T3, and means which control the machine such that the machine is only put into operattion when the temperature T3 has been reached.

32. A rotating machine according to claim 31, **characterized** in that the temperature T3 essentially corresponds to the expected operating temperature T0 of the stator.

33. A rotating machine according to claim 31, **characterized** in that the temperature T3 is somewhat lower than the expected operating temperature T0 of the stator, whereby T3 is preferably in the range of 0 - 20° C lower than T0.

34. A rotating machine according to claim 31, **characterized** in that the temperature T3 is somewhat lower than the expected operating temperature T0 of the stator, whereby T3 is preferably in the range of 0 - 10° C lower than T0.

35. A rotating machine according to any one of claims 26 - 34, **characterized** in that the winding (8; 18; 28) is designed in such a way that it is not secured in the stator slots (9; 19; 29) before the temperature T3 has been reached.

36. A rotating machine according to any one of claims 26 - 35, **characterized** in that it comprises at least one expandable conducting means (22) for transportation of a cooling and/or a heating medium, which conducting means is inserted in ducts (21) in the stator core which are adapted for this purpose, in addition to means for the expansion of said conducting means, whereby said conducting means, after having expanded, is pressed against the inside of the duct in order to obtain good contact and heat transfer.

37. A rotating machine according to claim 36, **characterized** in that the conducting means, before being inserted, is coated with a layer of fusible adhesive agent.

38. A rotating machine according to claim 37, **characterized** in that the fusible adhesive agent contains a filler having good thermal conductivity.

39. A rotating machine according to any one of claims 37 - 38, **characterized** in that said means for the expansion of the conducting means comprises means which simultaneously subject the conducting means to overpressure and heating, so that the conducting means bears on the walls of the duct and that said fusible adhesive agent melts and essentially fills all cavities between the conducting means and the walls of the duct, whereby the conducting means is secured against the walls of the duct.

40. A rotating machine according to any on of claims 36 - 39, **characterized** in that the conducting means, before being inserted in the duct, is deformed radially to correspond to a diameter smaller than the diameter of the duct.

41. A rotating machine according to any one of claims 26 - 40, **characterized** in that it comprises at least one expandable conducting means (17; 27) for transportation of a cooling and/or a heating medium, which conducting means is inserted in the slots (19; 29) of the stator core, into the cavities which are formed between the winding turns (18; 28) lying adjacent to each other, in addition to means for the expansion of said conducting means, whereby said conducting means after having expanded clamps the winding firmly within the stator slots.

42. A rotating machine according to claim 41, **characterized** in that the conducting means has a profile that principally corresponds to the geometrical cross-section of said cavities, preferably an essentially triangular profile.

43. A rotating machine according to claim 41, **characterized** in that the expandable conducting means for transportation of a cooling and/or a heating medium is inserted in the slots of the stator core in a vacuous condition.

44. A rotating machine according to claim 43, **characterized** in that said means for the expansion of the conducting means which is inserted in the slots of the stator core, comprises means for feeding a pressurised fluid into the conducting means.

45. A rotating machine according to any one of claims 36 - 42, **characterized** in that said means for the expansion of the conducting means (22; 17; 27)) comprises means for simultaneously subjecting the conducting means to overpressure and heating, and that the machine also comprises means for cooling the conducting means while retaining an overpressure, whereby the conducting means retains its expanded form.

46. A rotating machine according to claim 45, **characterized** in that it comprises means for circulation of a heat conducting pressurised fluid within the conducting means (22; 17; 27).

47. A rotating machine according to claim 46, **characterized** in that the pressurised fluid consists of the cooling and/or heating medium which is used at a later stage for cooling and heating the stator respectively.

48. A rotating machine according to any one of claims 36 - 47, **characterized** in that the cooling medium and the heating medium consist of the same heat conducting medium which is cooled and heated respectively.